

Use of Psychotropic Drug Prescriptions in a Prepaid Group Practice Plan

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ALTHOUGH psychotropic drugs have been an important part of the physicians' armamentarium for almost a decade, little is known about the conditions under which these drugs are used in the nonpsychiatric practice of medicine. This is true despite the fact that this class of pharmacological agents has achieved a high degree of eminence in modern medical practice (1). In an attempt to fill some of these gaps in our knowledge, a study was conducted to examine a number of variables which may be associated with the prescription of a psychotropic agent. (For this study, a psychotropic drug is defined as a chemical agent used primarily to relieve symptoms of mental and emotional origin without impairing consciousness.) In addition to the obvious variable of symptomatology, other factors such as the age and sex of the patient and the prescribing physician's specialty were also explored with respect to their possible association with the prescribing act.

Primarily for convenience, the facilities of the Group Health Association (GHA) of Washington, D.C., were used as an exploratory data source. This organization offers prepaid medical care to its subscribers within the framework of a group medical practice. It provides the diagnostic and therapeutic services of all medical specialties except psychiatry, in which only diagnostic service is offered.

During 75 percent of the time period covered by the study, the GHA had a subscribing membership of 23,000 persons. The membership consisted of single family units which could be

most accurately characterized as belonging to the urban middle class. While no specific socioeconomic data about the membership are available, discussion with the administrative officers of the association indicated that many of its members are government workers, professionals, teachers, and businessmen. In April 1959, an additional 10,000 persons were added to the membership through an arrangement with the transit workers. This group is more representative of the working class and was included in 1 of the 4 months covered by the study.

These characteristics of the population studied, in addition to the special features associated with this prepaid group medical practice, introduce a note of caution with regard to generalizations concerning the use of psychotropic agents in the private practice of medicine. Indeed, a similar note of caution must also be sounded with regard to generalizations to other plans which have a number of similar features. The Health Insurance Plan of Greater New York (HIP), for example, affords its services only on an en bloc basis to groups such as official agencies of the city of New York and labor unions. To the extent that the prescribing of a psychotropic agent is related to the socioeconomic status of the patient, generalization from these data to, say, HIP would be tenuous.

The specific objective of the present study was to identify those factors which are associated with the decision to prescribe a psychotropic agent. On an a priori basis, three general classes of factors were identified: (a) background variables of the patients such as age, sex, and race; (b) background variables of the physician such as age, experience, and specialty; and (c) the patient's symptomatology.

Symptoms were classified by medical subgroups, such as cardiovascular, central nervous

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system, and gastrointestinal, and also by two functional subclassifications, psychological and psychophysiological reactions. These detailed classifications and subclassifications were incorporated into the data recording form. The psychotropic drug prescribed, daily dosage in milligrams, and the route of administration were recorded for each prescription. (A copy of the data recording form can be obtained by writing to the senior author.)

Method

The technique used in this study was the retrospective examination of the medical records of GHA patients for whom a psychotropic agent had been prescribed. The advantages, as well as pitfalls and difficulties associated with this method, will be discussed in the Data Limitations section.

The association preserves its appointment lists, which are made by specialty, beyond the time of the scheduled appointment. In phase 1 of the study these lists provided the population pool from which the medical records to be examined were selected. Limited data collection time dictated that the months of the year be sampled, and 1 month from each season (January and April 1959, and July and October 1958) was selected. In order to stratify by the total number of appointments for each medical specialty, the total number of visits to each specialty in each of the sample months was ascertained. Patients' names were then selected at random from the appointment lists for the 4 study months in proportion to the total number of visits to each specialty.

In this manner 1,006 records were selected for examination from a total of 30,713 visits recorded by GHA during the 4 months. The records were read by a fourth-year medical student, Dr. J. A. Corbin, now of Bakersfield, Calif. His function was to examine each record selected at random, determine if a psychotropic agent had been prescribed, and, if such a prescription had been given, to record all the information necessary to complete the data recording form for that visit. Two hundred and twenty-one files were examined for the month of July, 256 for October, 243 for January, and 286 for April. A psychotropic agent had been prescribed in 14 visits (6 percent of the total

visits for the month) in July, 18 in October (7 percent), 8 in January (3 percent), and 16 in April (6 percent). The percentage of visits during which a psychotropic drug was prescribed for the 4 months combined was 5.6 percent.

The multiplicity of information to be recorded, combined with the plans for data analyses, made it obvious that the random sampling technique was not practicable. Meaningful data analyses could not be accomplished with so few prescriptions, and a different research strategy (phase 2) was devised. Each prescription filled by the GHA pharmacy during each of the 4 study months was examined by the student. He recorded the name and serial number of every GHA patient filling a psychotropic drug prescription and later examined the specific visit in the patient's file during which the drug was prescribed. (The data from phase 2 were examined and recorded in the same way as the data from phase 1.) To expand the total number of visits to be evaluated, prescriptions which were filled on the 5 working days preceding and the 5 working days following each study month were added, expanding the study period by 40 working days.

While this method guaranteed pay dirt, there are two difficulties inherent. The visits to be evaluated are not selected at random from all visits in which prescriptions were written, and the proportion of patients who filled their prescriptions at the GHA pharmacy is not known. It was possible, however, to estimate roughly this proportion, as described in the results section.

Results

During the 4 months there were 30,713 visits to GHA. To estimate the rate per 1,000 visits at which psychotropic drugs were prescribed during the study period (4 months plus 40 working days), it was first necessary to estimate the total number of visits to GHA during the expanded study period. The estimated number of visits was 44,066. In 1,032 of these visits, the patient was prescribed a psychotropic agent which he obtained at the GHA pharmacy. Thus, the estimated prescribing and filling rate for these agents was 23 per 1,000 visits.

This rate, however, is an underestimation of

Table 1. Frequency and percentage of psychotropic drug prescriptions by major classifications of drugs

Major classification of drugs	Number	Percent
Major psycholeptics.....	238	22.2
Phenothiazine derivatives (chlorpromazine, prochlorperazine, promazine).....	116	10.8
Rauwolfia alkaloids (rescinnamine, reserpine, deserpidine).....	122	11.4
Minor psycholeptics.....	543	50.7
Phenothiazine derivatives (promethazine).....	231	21.5
Compounds of miscellaneous structure (hydroxyzine).....	16	1.5
Substituted diols (meprobamate).....	296	27.6
Psychoanaleptics.....	291	27.1
Major antidepressives (iproniazid, methylphenidate, piperidol).....	43	4.0
Minor antidepressives (amphetamine and amphetamine-like substances).....	248	23.1
Total.....	1,072	100.0

the total rate of prescribing drugs, since it is known that not all patients given psychotropic prescriptions filled them at the pharmacy. An estimate of the total number of psychotropic prescriptions written during the study period was made by first determining the proportion of prescriptions appearing in phase 1 which also appeared in phase 2. Of the 56 prescriptions for psychotropic drugs which appeared in phase 1, 26, or 46 percent, also appeared in phase 2. From these data, it can be estimated that a psychotropic agent was prescribed in 2,243 of the total number of visits, or at the rate of 51 per 1,000 visits. This adjusted estimated

rate agrees quite closely with the rate obtained from the data in phase 1 in which, of the 1,006 visits selected at random, a psychotropic prescription was written 56 times, or at the rate of 56 per 1,000 visits.

In the study period, a total of 1,072 psychotropic prescriptions were written. The estimated total of all prescriptions written and filled at the GHA pharmacy for GHA patients during the study period was 26,802. Therefore, psychotropic agents accounted for about 4 percent of all prescriptions written during this time. During 40 of the visits, two psychotropic prescriptions were written, which means that 1,032 visits provide the data for the study.

About three-fourths of the 1,072 prescriptions for psychotropic agents written during the study period were for psycholeptic drugs, and about one-fourth were for psychoanaleptics. (A psycholeptic is a chemical agent which sedates without affecting consciousness. Psychoanaleptics are chemical agents used primarily for the treatment of depressive states.) Table 1 shows the percentage of the total breakdown by drug class.

The 781 prescriptions written for the tranquilizers (major and minor psycholeptics) represent about 3 percent of the estimated total number of prescriptions written by GHA physicians and filled at the GHA pharmacy during the study period. This is considerably lower than the estimates from national studies (2) which indicate that about 10 percent of all prescriptions written in this country contain a tranquilizer as one of their ingredients. In a recent study by Shapiro and Baron (3), on the

Table 2. Frequency and percentage of psychotropic drug prescriptions by month

Drug	January		April		July		October	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Amphetamine and amphetamine-like substances.....	60	23	46	19	71	29	71	22
Meprobamate.....	61	24	83	34	67	27	85	26
Promazine and prochlorperazine.....	16	6	25	10	28	11	35	11
Promethazine.....	61	24	50	20	40	16	80	25
Rescinnamine and reserpine.....	38	15	27	11	21	8	36	11
All others.....	21	8	13	5	22	9	15	5
Total ¹	257	100	244	100	249	100	322	100

¹ Percentages do not total 100 because of rounding.

other hand, tranquilizers accounted for 6 percent of the total volume of prescriptions; these data, which were obtained from a setting somewhat similar to that of GHA, are also lower than the national estimates. This difference between two prepaid medical settings and the general community may represent a real difference between the prescribing practices of physicians who choose prepaid group practice in which to work and physicians in private practice. It is more likely, however, that these differences are due to the different populations being surveyed. The *American Druggist* survey included prescriptions to psychiatric inpatients, ex-mental hospital patients, and others. Few of these kinds of patients are among the GHA or HIP participants.

To evaluate seasonal influences on the prescribing of psychotropic agents, a number of cross-tabulations in which this variable was included were performed. Some seasonal variation for some drugs was found (table 2). The percentage of meprobamate was higher for April than any other month. This is interpretable in terms of table 3, where it is shown that meprobamate was the drug of choice in the treatment of anxiety, and from table 4, which suggests that this symptom appeared relatively more frequently in April than in the other 3 months. The percentage drop in the use of promethazine in July is accounted for by cross-tabulation of the months by symptom groups, which showed that month to be lowest in respiratory infections. The other variations in

Table 3. Frequency and percentage of psychotropic drug prescriptions by psychological symptom

Drug	Symptom							
	Affective reaction ¹		Anxiety or tension		Obesity		Overconcern with physical symptoms	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Amphetamine and amphetamine-like substances.....	24	28	36	16	100	90	6	12
Meprobamate.....	26	31	121	52	7	6	25	48
Prochlorperazine.....	7	8	31	13	1	1	8	15
Promethazine.....	3	4	10	4	1	1	8	15
Rescinnamine and reserpine.....	5	6	9	4	0	0	1	2
All others.....	20	24	25	11	2	2	4	8
Total ²	85	100	232	100	111	100	52	100

¹ Depression (elation occurred in one instance).

² Percentages do not total 100 because of rounding.

Table 4. Frequency and percentage of psychological and psychophysiological symptoms by month

Symptom	January		April		July		October	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Affective reaction.....	23	14	15	8	25	11	11	5
Anxiety or tension.....	41	25	61	32	60	26	59	28
Obesity.....	26	16	18	9	28	12	34	16
Overconcern with physical symptoms.....	17	10	7	4	13	6	13	6
All others.....	57	35	89	47	107	46	92	44
Total ¹	164	100	190	100	233	100	209	100

¹ Percentages do not add to 100 because of rounding.

table 2 cannot be accounted for by reference to other cross-tabulations and are considered to represent the effects of chance variation.

Patient Variables

From the current study it is estimated that there are fewer than 126 prescriptions written annually for psychotropic drugs per 1,000 population in the GHA (table 5). This is a somewhat lower rate than the 210 per 1,000 reported by Shapiro and Baron in their study of the Health Insurance Plan of Greater New York. It must be remembered, however, that the current data are probably an underestimate, since not all prescriptions written at GHA are filled at its pharmacy. If we use the estimated total (2,243) of psychotropic drugs prescribed during the study months, the annual rate rises to about 264 per 1,000. The true rate probably lies somewhere between these extremes.

One of the outstanding differences in table 5 is the higher rate of prescribing psychotropic drugs for females than for males. The results of the Shapiro and Baron study suggest that this is neither an artifact of differential total prescription rates for males and females nor a consequence of variations in the rate of clinic visits, but appears to represent a true sex difference in the prescription rates of psychotropic drugs. In a recent unpublished study conducted by the National Disease and Therapeutic Index, it was found that a disproportionately larger number of psychotropic prescriptions were written for females than for males, even when the fact that females receive a much

Table 5. Psychotropic drug prescription rate per 1,000 GHA population during a 132-day period by sex of patient

Drug	Males (average N = 12,446)	Females (average N = 12,902)	Total (average N = 25,348)
Amphetamine and amphetamine-like substances	6	14	10
Meprobamate	8	16	12
Prochlorperazine	3	5	4
Promethazine	9	9	9
Rescinnamine and reserpine	6	4	5
All others	2	4	3
Total	33	51	42

higher proportion of all prescriptions than males was taken into account.

Sex differentials are found not only in the rate of prescribing the various drugs but in the proportions of the total number of prescriptions for each of the various agents (table 6).

Table 6. Frequency and percentage of psychotropic drug prescriptions by sex¹ of patient

Drug	Males		Females	
	Number	Percent	Number	Percent
Amphetamine and amphetamine-like substances	70	17	178	27
Meprobamate	94	23	202	31
Prochlorperazine	34	8	64	10
Promethazine	110	27	119	18
Rescinnamine and reserpine	73	18	46	7
All others	31	8	49	7
Total ²	412	100	658	100

¹ The sex of 2 patients was not stated in the record.

² Percentages do not total 100 because of rounding.

The most striking difference in drug prescriptions between the sexes is the much higher relative frequency of prescription of amphetamine and amphetamine-like substances for females than for males. The sex by psychological and psychophysiological reactions cross-tabulation provides the probable explanation for this phenomenon. Obesity was listed as a symptom 106 times; 24 percent of these were for males and 76 percent for females, and this drug, of course, is frequently used for appetite control. Further, an examination of table 7 indicates that almost half (45 percent) of the psychotropic prescriptions written by the obstetrician-gynecologists were for amphetamines, presumably to control excessive weight gain in their pregnant patients.

Differential relative frequencies of prescription by sex also exist for several other drugs and drug groups. Meprobamate was prescribed in 23 percent of the psychotropic prescriptions for males, and 31 percent of those for females (table 6). It has been noted that meprobamate is the drug of choice for the symptom of anxiety or tension, and cross-tabu-

lation of psychological and psychophysiological reactions by sex revealed that anxiety was noted in 69 percent of the visits by female patients in which a psychotropic drug was prescribed, while this number is 31 percent for male patients.

Sex differences also emerged with respect to the relative frequency of prescription of the antihypertensive agents, rescinnamine and reserpine. Eighteen percent of the total number of psychotropic agents prescribed for male patients were for these agents, while they represented only 7 percent of the total number of prescriptions for females. Cross-tabulation of symptom groups by sex revealed that a higher proportion of cardiovascular disease was treated by psychotropic drugs for males (54 percent) than for females (46 percent).

While a sex difference emerged for the relative frequency of prescription of promethazine, the meaning of this difference is not clear. The major use of promethazine at GHA was for the treatment of respiratory infections. Twenty-seven percent of the males treated with psychotropic agents received this drug, while only 18 percent of the females were treated with promethazine (table 6). The sex by symptom groups cross-tabulation revealed, however, a higher proportion of respiratory infections for females (53 percent) than for males (46 percent). Yet, the sex by physician's specialty cross-tabulation showed that an ear, nose, and throat specialist was consulted in 24 percent of the visits in which male patients were prescribed a psychotropic drug, while the comparable figure for female patients was 17 percent. This suggests that symptoms other than respi-

ratory were being treated by promethazine a greater proportion of the time in females than in males.

In evaluating the possible effects of a patient's age on the prescribing of a psychotropic agent, it would be important to know the frequency of clinic visits by age group. These data, by total visits, are not available. However, it is possible to examine the percentages of total psychotropic prescriptions for each drug group by age (table 8).

Whether the low frequency of prescriptions for those 0-19 years and 70-89 years reflects conservative use of these drugs with these age groups, or differential clinic use as a function of age, or whether it is a function of the low proportion of the total GHA population in these groups, cannot be determined since the total age distribution is not available.

At first blush, the fact that the antihypertensive agents make up an increasing proportion of the total for the three age groups from 40-69 seems reasonable, since greater frequency of hypertension is expected with increasing age, yet the age by drugs cross-tabulation revealed that 38 percent of the total number of occurrences of cardiovascular symptoms are in the age group 50-59, and 24 percent in the age group 60-69. This may mean that the specific symptom of hypertension occurs with greater relative frequency in the 60-69 age category, while a larger variety of cardiovascular illness is encountered in the 50-59 age brackets and is treated with drugs not specific for hypertension.

Meprobamate is used with relatively high frequency in all age groups from 20 to 69. This is not surprising, since the symptom, anxiety

Table 7. Frequency and percentage of total psychotropic prescriptions by physicians' specialty

Drug	Internal medicine		Obstetrics-gynecology		Ear, nose, and throat	
	Number	Percent	Number	Percent	Number	Percent
Amphetamine and amphetamine-like substances.....	172	26	58	45	7	3
Meprobamate.....	210	32	42	33	21	10
Prochlorperazine.....	75	11	16	12	4	2
Promethazine.....	31	5	7	5	163	80
Rescinnamine and reserpine.....	115	18	0	0	2	1
All others.....	51	8	6	5	8	4
Total.....	654	100	129	100	205	100

Table 8. Frequency and percentage of total psychotropic drug prescriptions by age of patient

Drug	Age group (years) ¹													
	19 and under		20-29		30-39		40-49		50-59		60-69		70 and above	
	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent
Amphetamine and amphetamine-like substances	10	15	20	30	60	34	79	24	51	19	19	15	5	14
Meprobamate	3	5	15	22	43	25	104	32	86	32	33	27	10	27
Prochlorperazine	2	3	12	18	24	14	20	6	34	13	5	4	1	3
Promethazine	42	64	11	16	38	22	73	22	38	14	22	18	7	19
Rescinnamine and reserpine	0	0	2	3	3	2	30	9	41	15	34	27	9	24
All others	9	14	7	10	7	4	23	7	18	7	11	9	5	14
Total ²	66	100	67	100	175	100	329	100	268	100	124	100	37	100

¹ The age of 6 patients was unknown.

² Percentages do not add to 100 because of rounding.

or tension, accounts for the highest proportion (28 percent) of psychological and psychophysiological symptoms for these age groups.

The relatively high frequency of amphetamine prescriptions in the 30-39 age classification may be accounted for by two facts. Although the symptom obesity accounts for only 21 percent of the total of psychological and psychophysiological symptoms in this age group, 67 percent of the pregnancies noted occurred in this age group. It has already been observed that amphetamines are frequently used to control excessive weight gain during pregnancy.

The relatively high frequencies of amphetamine prescriptions in the 20-29 and 40-49 age brackets are difficult to explain, since obesity was mentioned for 22 percent of the patients in the 20-29 group, and for only 13 percent of the total in the 40-49 group.

An examination of drug dosages by age of the patient revealed that psychotropic agents were prescribed in smaller dosage to those under 19 years than to the rest of the patient population. All other age groups were prescribed psychotropic drugs in approximately equal dosages.

Physician Variables

An examination of the differential prescribing habits of the various medical specialties was undertaken to determine the effect of medi-

cal specialty on the prescription of psychotropic drugs. Specialties other than the three listed in table 7 were not included because of their low frequencies of prescription.

Meprobamate accounts for approximately one-third of the psychotropic drugs prescribed by internists and obstetrician-gynecologists. When specialty was cross-tabulated with psychological and psychophysiological reactions, it was discovered that approximately half of the symptoms (with frequencies over 50) mentioned by these specialists were for anxiety or tension. These findings again suggest the specificity of use of this drug in the control of anxiety states.

More than one-fourth of the prescriptions written by internists and almost half the prescriptions written by obstetrician-gynecologists were for the amphetamines. For the internist these data are consistent with those revealed from the cross-tabulation of physicians' specialty by psychological and psychophysiological reactions, which indicated that approximately one-fourth of the total of these symptoms was obesity. However, less than one-third of the total symptoms listed by obstetrician-gynecologists were obesity. This suggests that the obstetrician-gynecologist may use amphetamines in his patients as a preventive measure. The drug may also be used for cosmetic reasons, since table 2 shows that the highest percentage of amphetamines is prescribed in

July, which corresponds quite closely with the bathing-suit season.

Eighteen percent of all psychotropic prescriptions written by internists were for the antihypertensive agents. This is consistent with the finding from the physicians' specialty by symptom groups cross-tabulation, which revealed that in 17 percent of the visits in which a psychotropic was prescribed by an internist, cardiovascular disease was noted.

The overwhelming use of promethazine by the ear, nose, and throat specialists is reflected in the fact that in 82 percent of the cases in which a psychopharmacological agent was prescribed by this specialty, the symptoms were respiratory.

When the proportion of psychotropic prescriptions to the estimated total number of prescriptions written by each specialty was determined, it was found that 7 percent of all prescriptions written by internists were for psychotropics; the corresponding proportion written by obstetrician-gynecologists was 8.5 percent, and by ear, nose, and throat specialists, 7 percent. As has already been noted, the majority of prescriptions written by the ear, nose, and throat specialists were for promethazine.

For all other specialties, psychotropic drug prescriptions were 2 percent or less of their totals.

Cross-tabulation of physicians' specialty by symptom groups indicated that ear, nose, and throat specialists, while one of the heaviest psychotropic drug prescribers, used them only 9 percent of the time for the treatment of a psychiatric problem. Eighty-two percent of use was for respiratory difficulties. For 41 percent of the prescriptions written by internists and for 38 percent of those by obstetrician-gynecologists, psychological and psychophysiological factors were present.

The 41 percent for the internists is probably an underestimate of the percentage of psychological and psychophysiological reactions among all symptom groups. Of the symptom groups recorded by the internists gastrointestinal difficulties represented 14 percent and it is impossible to estimate what proportion of these were actually of psychophysiological origin. In evaluating the records, second guessing of the physician by the scorer was not permitted. It seemed clear, however, that the frequent prescription of meprobamate for gastrointestinal symptoms indicated the presence of emotional disturbance in many of these patients, even

Table 9. Frequency and percentage of total psychotropic drug prescriptions by symptom group

Symptom group	Amphetamine and amphetamine-like substances		Meprobamate		Promazine and prochlorperazine		Promethazine		Rescinnamine and reserpine		All others	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Cardiovascular	18	5	39	8	17	8	4	1	107	55	16	12
Central nervous system	7	2	20	4	5	2	2	0	4	2	4	3
Dermatological	5	1	11	2	1	0	4	1	3	2	5	4
Gastrointestinal	26	7	58	11	59	29	6	2	13	7	12	9
Genitourinary	21	6	30	6	4	2	6	2	8	4	3	2
Musculoskeletal	26	7	66	13	15	7	6	2	13	7	10	8
Respiratory	19	5	24	5	19	9	140	40	6	3	5	4
Eye	2	0	7	1	1	0	7	2	2	1	1	1
Ear	4	1	12	2	6	3	36	10	2	1	6	5
Nose	3	1	4	1	2	1	116	33	7	4	2	2
Surgical	2	0	7	1	1	0	2	0	2	1	2	2
Psychological	184	50	181	36	53	26	18	5	21	11	45	35
Psychophysiological	14	4	32	6	14	7	2	0	8	4	13	10
Pregnancy	35	10	14	3	8	4	3	1	0	0	4	3
Total ¹	366	100	505	100	205	100	352	100	196	100	128	100

¹ Percentages do not add to 100 because of rounding.

though the physician did not make this explicit. An informal check revealed that, in many instances, emotional disturbance had been noted during previous visits, but for the visit covered by the study, only physical problems were mentioned. In connection with this, it is of interest to note that 25 percent of the total psychological and psychophysiological reactions were recorded in the "other" symptoms category. Apparently, the a priori categories of psychiatrists and psychologists could not cope with the varieties of descriptions of mental states used by nonpsychiatric physicians.

One of the most striking features of the data is the frequency with which psychotropic agents are prescribed for nonpsychological symptoms. Table 9 shows this quite clearly. These data represent the frequency of occurrence of one or more symptoms, in each symptom group, for each of the drugs listed. The only drugs which are prescribed 50 percent of the time for psychological and psychophysiological complaints are the amphetamine and amphetamine-like substances. Even this percentage is considerably inflated, however, by the inclusion of obesity in the "psychological" symptoms group. If obesity were excluded, the use of these drugs for the treatment of psychological symptoms would decrease considerably. Table 3 indicates that obesity accounts for 60 percent of the prescriptions for these drugs. With the exclusion of obesity as a psychological symptom, only 79 amphetamine prescriptions were written for psychological and psychophysiological symptoms (table 9), and the total of these symptoms, for all psychotropic drugs prescribed, is reduced from 585 to 466. (Note that table 3 is concerned with the frequency of individual symptoms, while table 9 deals with the frequency of symptom groups.) Since the grand total of all symptom groups is 1,752, it can be estimated that psychological and psychophysiological symptoms were being treated in only 27 percent of those instances where a psychopharmacological agent was prescribed.

The fact that meprobamate was used in the treatment of psychological and psychophysiological symptoms only 42 percent of the time is somewhat surprising, but this is at least partially explainable by the fact that nonpsychiatric physicians will frequently treat a symp-

tom of psychophysiological origin and mention only the physical manifestations of the illness. This may also explain the high frequency of use of promazine and prochlorperazine in the treatment of nonpsychological symptoms. Prochlorperazine is frequently used for the treatment of nausea. From these data, however, it is not possible to estimate what proportion of the time this symptom was psychophysiological in origin.

The physicians' age and years of experience were examined with respect to the possible relationships between these variables and the prescribing of psychotropic agents. The data indicate that age and experience are not related to psychotropic drug prescribing.

Table 10 contains the median dosages of all psychotropic drugs which occurred with frequencies greater than 10, and the dosage ranges for each of these drugs as noted in the March 1, 1961, list of "Clinically Available Psychotropic Drugs" prepared by the Pharmacology Unit of the Psychopharmacology Service Center (PSC), National Institute of Mental Health. In general, the median dosages at GHA hover around the low end of the dosage range. This is not surprising, in view of the fact that the

Table 10. Frequencies, median dosages, and oral dosage ranges of the more common psychotropic drugs

Drug	Frequency	GHA median daily dosage (mg.)	Usual daily dosage range ¹ (mg.)
Psycholeptics:			
Chlorpromazine-----	12	67.5	100-1,000
Hydroxyzine-----	16	27.5	30-75
Meprobamate-----	² 292	800.0	600-1,600
Prochlorperazine-----	98	20.0	15-40
Promethazine-----	231	25.0	50-150
Rescinnamine-----	³ 38	.38	0.5-1.0
Reserpine-----	³ 81	.25	1-5
Psychoanaleptics:			
Amphetamine and amphetamine-like substances----	248	10.0	5-40
Iproniazid-----	³ 16	50.0	30-75
Methylphenidate----	24	20.0	15-30

¹ From the Psychopharmacology Service Center list of "Clinically Available Psychotropic Drugs" (March 1, 1961).

² Dosage not recorded for 2 patients.

³ Dosage not recorded for 1 patient.

dosage ranges in the PSC list were obtained mainly from the psychiatric literature and pertain primarily to the drug treatment of more severely disturbed patients.

The fact that the PSC compilation lists oral dosages only presents no problem of comparability. Of the 1,072 prescriptions covered by the study, 1,060 were for oral administration, while only 3 were for suppositories and none were for parenteral administration. In nine instances, the route of administration was not recorded.

Data Limitations

There are a number of difficulties inherent in the retrospective examination of medical records. If preestablished procedures for recording medical information are not followed, the busy physician will frequently write his records in a perfunctory manner, particularly if he knows the patient well. Second, the physician may not record information in a manner necessary to study the relationships which are of paramount importance to the investigator.

Third, the nonpsychiatric physician is basically oriented toward the diagnosis and treatment of organic illness. While he may be aware of coexisting psychological difficulties, he may, nevertheless, record only the organic symptoms present at the time he decides to prescribe a psychopharmacological agent. For example, in his treatment of a hypertensive patient, he might prescribe reserpine and record only that the patient is suffering from hypertension. He may be aware, however, that his patient is also suffering from severe anxiety and may have in mind the tranquilizing as well as the antihypertensive properties of this particular agent. Finally, if more than one symptom was recorded when the prescription was written, one cannot be certain which symptom the drug was supposed to relieve. In brief, the retrospective examination of medical records will frequently fail to reveal all the reasons for the dispensing of a particular drug.

The reliability of data collected retrospectively from medical records also presents a problem. As a rough check on the scoring accuracy of the medical student, two physicians, a pediatrician and a general practitioner, inde-

pendently scored a number of records previously scored by the student. While agreement was high with respect to the identification of symptom groups, considerable disagreement emerged with respect to particular symptoms within symptom groups. Symptoms common to a number of symptom groups, headache, for example, also presented difficulties.

The biases of the record reader also tend to produce dissimilarity in recording. This is particularly true when the symptom has an almost equal probability of being a medical symptom or a symptom of psychogenic origin. As an illustration, on a particular visit the physician may note abdominal pain and anxiety or tension as presenting symptoms. It is a moot point whether the gastrointestinal symptom should be entered in the symptom category, "gastrointestinal," or under the symptom group, "psychophysiological gastrointestinal reaction."

Additional errors result from the fact that the records are written, generally in haste, in the physicians' own handwriting. The doubtful legibility of these entries increases the probability of error considerably and leads to the conclusion that a certain amount of elasticity is a necessary characteristic of retrospectively collected data.

A more appropriate strategy for obtaining information of this type would be to develop special procedures and forms to collect the data. The physician would complete the forms at the time the patient was seen. As a minimum, the physician would be asked to identify the desired effect of the prescribed medication on the specific symptom being treated. While this would mean the loss of considerable amounts of data already accumulated, it would tend to eliminate some of the difficulties cited and increase the investigator's confidence in the reliability and meaningfulness of the data collected.

Summary

This study explored some of the variables associated with the prescribing of psychotropic drugs by nonpsychiatric physicians in the Group Health Association of Washington, D.C., a prepaid medical plan. The estimated rate of

psychotropic drug prescriptions was found to be 51 per 1,000 visits for the study period (132 working days). Of the total of 1,072 psychotropic prescriptions written, about three-fourths were for the psycholeptics, and about one-fourth were for the psychoanaleptic agents. The psycholeptics (tranquilizers) accounted for about 3 percent of the estimated total of prescriptions written and filled at the GHA pharmacy during the study period.

Seasonal variations found for certain drugs were ascribed to seasonal variations in certain symptoms. One of the striking differences found was the higher rate of prescribing psychotropic drugs for females than for males. This was particularly true for the amphetamines and amphetamine-like substances. Smaller sex differences also were noted for several other drugs.

Psychotropic agents were prescribed with very low frequency to patients under 19 and over 70 years. Whether this is a real difference, or reflects the less frequent use of the clinic by these age groups, or is a function of the low proportion of the total GHA population in these groups is not known. Antihypertensive agents were prescribed more frequently for those in the 40-69 age group than in the other age categories. Meprobamate ranked first in the 40-69 group, but dropped in rank in the 40 and under category. Overall, dosages were smaller for patients 19 and under than for the rest of the population. No dosage differences appeared in the age groups over 19.

Meprobamate accounted for approximately one-third of the psychotropics prescribed by internists and obstetrician-gynecologists. Almost half of the psychotropic prescriptions written by the obstetrician-gynecologists were for amphetamines, while only about one-fourth of the internists' psychotropic prescriptions were for this drug. Promethazine accounted for 80 percent of the total psychotropic prescriptions written by the ear, nose, and throat specialists. For each of the three physician specialties mentioned, psychotropics constituted 7 to 8.5 percent of the estimated total number of prescriptions written by them during the study period. Psychotropics comprised 2 percent or less of the total prescriptions written by the other specialties. The age and years of

experience of the physicians did not affect their rate of prescribing psychotropic agents.

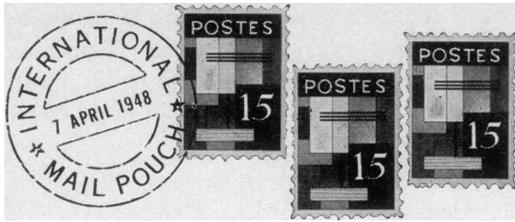
One of the most striking findings of the study was the high frequency with which psychotropic agents are prescribed for the treatment of nonpsychological symptoms. It was estimated that psychological and psychophysiological symptoms were being treated in only 27 percent of those instances where a psychopharmacological agent was prescribed. This finding might in part be explained by the tendency of non-psychiatric physicians to record only the physical and not the psychological aspects of the patient's illness.

The median dosages of each of the drugs used at GHA, which were prescribed almost exclusively for oral administration, were compared with the dosage ranges appearing on the drug and dosage list prepared at the Psychopharmacology Service Center, National Institute of Mental Health. For most drugs, dosages prescribed at GHA tended to cluster around the lower end of the range. This may be due to the fact that the dosage ranges on the list were derived primarily from the psychiatric literature, which includes dosages administered to more severely disturbed individuals. For this reason there is no implication that GHA physicians use these drugs in lower dosages than other nonpsychiatric physicians either in other prepaid group medical settings or in private practice.

The relationships discovered in the study can be generalized to the community at large only in a limited fashion because of the particular qualities of the study's medical setting. In addition, some of the data limitations imposed by the retrospective examination of medical records tend to limit application of the data even to the total GHA population. A more appropriate strategy for research of this type was discussed.

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NIH Office in Rio de Janeiro

The National Institutes of Health opened an office in Rio de Janeiro, Brazil, in July 1962 to administer Public Health Service research activities in Latin America. The office will represent NIH in negotiations with Latin American institutions engaged in medical research, collect information on medical research potential and need in Latin America, advise NIH grantees in the area, and assist NIH advisory groups by conducting visits to institutions proposing research projects for NIH support.

The office will also be responsible for conducting negotiations with scientists and government officials of other nations in connection with cooperative research agreements. Such research projects would be financed by Public Law 480 funds, which result from the sale of surplus U.S. agricultural commodities abroad.

Acting chief of the Rio office is Dr. Dieter Koch-Wesser, associate professor, department of medicine, Western Reserve University. Dr. Herbert T. Dalmat, National Institute of Neurological Diseases and Blindness, is assistant chief, and Lawrence Maxcy is administrative officer.

Border Campaign Against Rabies

A broad attack on rabies is being conducted on the United States-Mexico border following an agreement between the two countries signed late last year. Concern about rabies has been growing on both sides of the border; in 1961 a fifth of the 3,400 animal rabies cases reported in the United States occurred in the four States bordering Mexico.

Signers of the agreement were Dr. José Alvarez Amezcua, Secretary of Health of Mexico, Dr. Theodore J. Bauer, Assistant Surgeon General of the Public Health Service, Dr. Alfredo Bica of the Pan American Health Organization, part of the World Health Organization, and Clifford C. Presnall, chief of predator and rodent control, U.S. Fish and Wildlife Service. Health officials of the border States also signed the agreement.

The first step in the new campaign against rabies was a series of special training courses to bring Mexican and U.S. rabies control workers up to date on the newest techniques for controlling the disease in wild as well as domestic animals.

Another step was the assignment of four rabies experts, two from the Federal health service of each country, to permanent duty along the border. The two national governments are also providing technical consultation for State and local officials and laboratory services, and are conducting research into patterns of spread of rabies, effectiveness of rabies vaccine, and habits of rabies vectors.

State and local health agencies on both sides of the border are working to improve reporting of rabies cases, to revise local legislation to help control efforts, and to set up local advisory councils with both technical and community members to promote and coordinate activities and public education. Rabies control workers along the border will hold periodic international meetings to coordinate activities and check progress.

Foodborne Outbreak in Shiraz

After a New Year's Eve party at a hotel in Shiraz, Iran, 61 of 86 guests experienced violent nausea, diarrhea, fever, tenesmus, headache, and arthralgia.

The Shiraz Public Health Department asked those attending the party which foods and beverages they had consumed and when illness began. Officials inspected the sanitary conditions of the hotel kitchen, and examined stool specimens of the hotel foodhandlers and four patients.

No samples of the foods remained for examination. Three dishes were served; olive salad, kabab (a meat and vegetable dish), and fish, as well as oranges and tangerines and alcoholic and non-alcoholic drinks.

Analysis of the incubation period, which ranged from 8 to 32 hours with a concentration between 12 and 22 hours, suggested a salmonella-like infection. *Salmonella hindmarsh* was identified in stool specimens of two of the four patients. Examinations of specimens from the foodhandlers were negative except for a few identifications of *Escherichia coli*. —DR. MAHMOUD SHAHRIARI, *director of health (medical) and Public Health Department* and DR. KAZEM SHAYAN, *deputy director, Public Health Department, and chief, preventive medicine section, Public Health Department, Fars Province, Shiraz, Iran.*